

NON-PUBLIC?: N
ACCESSION #: 9205220169
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Indian Point Unit No. 2 PAGE: 1 OF 05

DOCKET NUMBER: 05000247

TITLE: RPS Actuation Resulting from Turbine Trip on High Steam Generator Level

EVENT DATE: 04/13/92 LER #: 92-007-00 REPORT DATE: 05/13/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 025

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Claude Peart, Senior Engineer TELEPHONE: (914) 526-5190

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: Yes EXPECTED SUBMISSION DATE: 07/30/92

ABSTRACT:

On April 13, 1992 at approximately 2213 hours, with the Unit operating at 25% power, a reactor trip was initiated by a turbine trip. The turbine trip occurred as a result of a high level in steam generator (SG) No. 23. The SG level excursion occurred as a result of operator actions in response to a condenser low hotwell level condition due to misalignment of condenser hotwell 22 B outlet valve CS-1-3. The operators responded to the plant trip event in accordance with established plant procedures and the plant systems responded as expected, with the exception of the motor driven auxiliary feedwater pumps (MDAFWP). MDAFWP 21 started and tripped several times within a period of approximately 74 seconds, and MDAFWP 23 did not auto start at all due to low suction pressure. This condition was rectified by the closing of condensate level control valve LCV-1128 which was opened earlier by the operators in response to the low hotwell level condition. Also, the main boiler pump was noted as cycling

through trip/reset several times after the reactor trip.

The plant entered normal recovery procedures at approximately 2227 hours. No NRC limit was exceeded and there was no impact on public health and safety.

END OF ABSTRACT

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse 4-Loop Pressurized Water Reactor

IDENTIFICATION OF OCCURRENCE:

Reactor trip on turbine trip initiated by high Steam Generator level.

EVENT DATE:

April 13, 1992

REPORT DUE DATE:

May 13, 1992

REFERENCES:

Significant Occurrence Report (SOR) 92-190, 92-191, 92-191A

PAST SIMILAR OCCURRENCE:

None

DESCRIPTION OF OCCURRENCE:

At approximately 2030 hours on April 13, 1992, a turbine supervisory instrument (TSI) high vibration alarm was received for 22 main boiler feed pump (MBFP). Suction pressures and pump speeds were oscillating for both 21 and 22 MBFP. Abnormal Operating Procedure, A21.1.1 "Loss of Feedwater" was entered and a power reduction from 100% commenced in order to maintain steam generators (SG) within their required levels. SG blowdown was secured and the motor driven auxiliary feedwater pumps (MDAFWP) were manually started at approximately 2033 hours.

The load reduction was discontinued and the unit stabilized at

approximately 70% reactor power. At approximately 2036 hours the MDAFWP were secured.

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DESCRIPTION OF OCCURRENCE: (Continued)

However, Feedwater oscillations continued, and reactor power was reduced to 25%. At this point, the Senior Reactor Operator (SRO) determined that hotwell inventory was in fact the problem as opposed to a feedwater system problem and directed valve LCV-1128 be opened. This valve supplies water to the condenser hotwells via a 12 inch pipe from the Condensate Storage Tank (CST). It is normally kept closed since the preferred source of makeup for the condenser hotwells is from the water treatment plant. LCV-1128 was opened at approximately 2205 hours, and had the effect of immediately increasing MBFP suction pressure and eliminating the oscillations.

At approximately 2213 hours, a turbine trip occurred due to 23 SG high level. Reactor power, at 25%, was above the P-8 Turbine trip/reactor trip permissive interlock (20%) when this occurred. Consequently, the reactor tripped immediately upon the turbine trip.

The MDAFWP received a start signal from the tripping of 21 MBFP. MDAFWP 21 attempted to start six times over the next 74 seconds and MDAFWP 23 did not start at all. Seventy-four seconds after the reactor tripped, LCV-1128 was closed and the MDAFWPs were manually started. The reset permissive light on MBFP 21 was reported as cycling through trip/reset several times, after the reactor trip.

ANALYSIS OF OCCURRENCE:

This report is being made since actuation of the reactor protection system (RPS) occurred. Any manual or automatic actuation of the RPS is reportable under 10 CFR 50.73(a)(2)(iv). There were no adverse safety implications for this event. All systems, with the exception of the MDAFWPs and MBFP 21 discussed previously, performed as expected. After its rapid successive cycling, MDAFWP 21 was tested and its condition determined to be acceptable.

CAUSE OF OCCURRENCE:

Prior to the reactor trip, there had been a series of salinity excursions occurring in condenser 22. A tagout package was used to isolate the circulating waterbox pump side of the condenser. Condenser hotwell 22B outlet valve CS-1-3 was closed as part of the isolation of the affected

hotwell and was not logged.

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CAUSE OF OCCURRENCE: (Continued)

On April 9, 1992, work on condenser 22 had been completed and the condenser returned to service. The tagout package that had isolated the circulating water side of the water box was cleared. Since the status change of valve CS-1-3 had not been logged, the assumption was made that valve CS-1-3 was open. With CS-1-3 closed, condenser 22B hotwell was isolated from the condensate pumps creating a condition for potential misindication of hotwell level. This indication caused the operator to reduce makeup to the hotwell which resulted in a decrease in the actual hotwell level.

A subsequent human factors evaluation of the circumstances involved in this event revealed that pertinent plant procedures did not address all the appropriate alignments required to isolate the condenser waterboxes for cleaning. Efforts to correct these conditions and enhance procedures as necessary are either planned or have already been initiated.

The root cause of this event is therefore attributed to cognitive error on the part of operations personnel involved.

The reason for the MDAFWPs anomaly when a valid start signal was generated is believed to be due to a hydraulic phenomena that caused the pressure to drop to or below the low pressure switch setpoint, at the suction of the MDAFWPs created by LCV-1128 being open and additional flow due to MDAFWP 21 starts. The root cause for the hydraulic phenomena as well as the MBFP 21 cycling is being evaluated and this LER will be supplemented when this effort is completed.

Subsequent to the trip a test was conducted on MDAFWP 21 to determine if the successive rapid cycling had adversely impacted the pump's functional capability. The test revealed that the pump was still capable of fulfilling its functional requirements. Also, a temporary modification was effected to block valve LCV-1128 in the closed position in order to eliminate the low pressure condition imposed at the suction of the MDAFWPs with LCV-1128 fully open while the condenser is under a vacuum. A test was conducted which verified the ability of the MDAFWP to deliver the required flow while bypass valve LCV-1128A was fully opened and making up to the hotwells. This is an interim measure until a more thorough evaluation to ascertain root cause for both the MBFP and MDAFWP cycling is completed.

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CORRECTIVE ACTION:

1. MDAFWP 21 condition was verified by tests and determined acceptable subsequent to its rapid successive cycling after the reactor trip. Also as an interim measure, a temporary modification was affected to block valve LCV-1128 in the closed position and use bypass valve LCV-1128A for normal make up to the condenser. This alignment was confirmed by a test to have no adverse impact on the MDAFWP to deliver the required flow.
2. The root cause for the anomalies observed for MBFP 21 and the MDAFWPs is currently being evaluated by Plant Engineering. When this evaluation is completed this LER will be supplemented to reflect the appropriate corrective action.
3. Our expectations for field operator log keeping, specifically with regard to equipment status and turnover are being re-emphasized by meetings with watch crews and operations management.
4. Pertinent plant procedures regarding water box isolation, log keeping and equipment status are being revised to provide additional clarification as appropriate.

ATTACHMENT 1 TO 9205220169 PAGE 1 OF 1

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Vice President

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May 13, 1992

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 92-07-00

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

The attached Licensee Event Report LER 92-07-00 is hereby submitted in accordance with the requirements of 10 CFR 50.73.

Very truly yours,

Attachment

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